July 29th, 1959.

COPY

Mr. Elmer Helferich,
% Watson, Leavenworth, Kelton & Taggart,
100 Park Avenue,
New York 17, N.Y.

Dear Mr. Helferich:-

This letter will describe to you recent designs for the purpose of ventilating filter tips on cigarettes.

It has been demonstrated by the PM Research and Development Department that by introduction of air or "ventilation" at the front end of a filter tip, that is the end away from the mouth, or into the space of a plug-space-plug filter tip, substantial reduction in the delivery of tars and nicotine over that of a non-ventilated filter tip can be achieved. In order to accomplish this purpose we have experimentally prepared cigarettes following four basic designs:

1. Ventilation of a Solid Flush Filter. This is achieved by perforating the plug wrapper with a large number of very small holes and by perforating with a limited number of holes the tipping paper at the point at which air is to be introduced. We have, for example, used in the plug wrapper 3 to 5 mil perforations to the extent of 1,000 holes per sq. in. The tipping paper is perforated in a narrow band with varying number of holes, depending upon the extent of ventilation desired. We have, for example, used openings 3 to 5 mils in size in the range of 300 to 1,000 holes per sq. in. In this arrangement ventilation requires that the position of some holes in the tipping paper must coincide with some holes in the plug wrap so that air may freely pass from the outside into the filter material. The chance of this occurring is increased by having a large number of holes in the plug wrapper.

2. Ventilation of the Front Plug in the P-S-P Filter. This is accomplished in the same manner as ventilation of the solid flush filter except that only the first plug in the P-S-P system is wrapped with a perforated wrapper. The tipping paper is perforated in a band at the position of the front plug. In this case the mouthpiece paper must also be perforated. The perforations here were made larger in size, approximately 20 to 50 mils in diameter, and of a frequency between 100 and 700 to the sq. in. In this case the larger holes of the mouthpiece paper act as a manifold, permitting the ventilation to occur even though the holes in the tipping paper do not coincide exactly with those in the plug wrap.

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3. Ventilation of the Space in the P-S-P Filter. This is accomplished by moving the perforated band in the tipping paper back to coincide with the position of the space. The mouthpiece paper must, of course, be perforated as in Paragraph 2.

4. Ventilation of Both Forward Plug and Space in the P-S-P Filter. This is accomplished by a combination of the arrangements made under Paragraphs 2 and 3 above.

In all these instances it is necessary that the holes in the tipping paper be sufficiently large, or that the glue used in applying the tipping paper be sufficiently fluid so that the openings in the tipping paper are not sealed in the process of attaching the filter plug to the cigarettes, that is when the tipping paper is applied. Our experience has been that using the regular glues now being employed in our manufacturing process the openings in the tipping paper must exceed approximately 1 or 2 mils in diameter. Most important from our present point of view is the fact that by the methods outlined above ventilation can be introduced into the filter plug without any modification in the manufacturing process whatsoever.

I am enclosing samples of experimental cigarettes embodying the principles outlined in Paragraphs 2, 3 and 4 above. I do not now have cigarettes corresponding to Paragraph 1, but will send them to you as soon as they are available.

If you have any further questions please feel free to contact me.

Sincerely,

H. Wakeham
Staff Assistant for Research

HW:HR
Encl.